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ASSIGNMENT BOOKLET 1C

SCN1270 Science 10
Module 1: Section 3 Assignment

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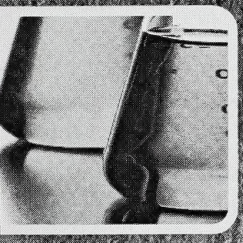
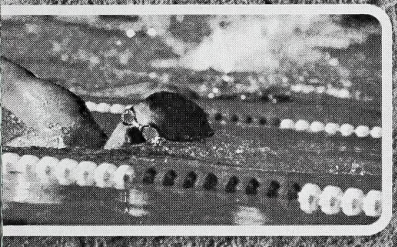
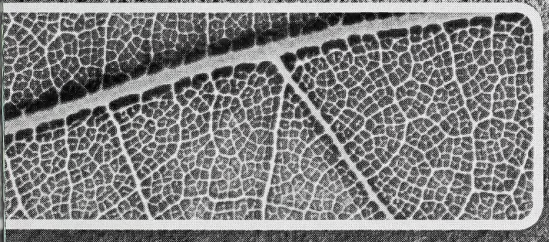
SCIENCE 10

Module 1

Energy and Matter in Chemical Change







Assignment Booklet 1C

Learning Technologies Branch

Alberta EDUCATION

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Summary

	Total Possible Marks	Your Mark
Section 3 Assignment	42	

Teacher's Comments

Science 10
Module 1: Energy and Matter in Chemical Change
Assignment Booklet 1C
Section 3 Assignment
Learning Technologies Branch
ISBN 0-7741-2696-5

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The Learning Technologies Branch acknowledges with appreciation the Alberta Distance Learning Centre and Pembina Hills Regional Division No. 7 for their review of this Assignment Booklet.

This document is intended for	
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Teachers	✓
Administrators	
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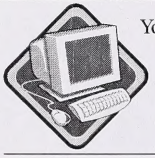
General Public	
Other	



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- Alberta Education, **http://www.education.gov.ab.ca**
- Learning Technologies Branch, **http://www.education.gov.ab.ca/ltb**
- Learning Resources Centre, **http://www.lrc.education.gov.ab.ca**

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ASSIGNMENT BOOKLET 1C
SCIENCE 10: MODULE 1
SECTION 3 ASSIGNMENT

This Assignment Booklet is worth 42 marks out of the total 140 marks for the assignments in Module 1. The value of each assignment and each question is stated in the left margin.

Read all parts of your assignment carefully and record your answers in the appropriate places. If you have difficulty with an assignment, go back to your Student Module Booklet and review the appropriate lesson. Be sure to proofread your answers carefully before submitting your Assignment Booklet.

Section 3 Assignment: Chemical Change

42

For questions 1 to 4, read each question carefully. Decide which of the choices BEST completes the statement. Place your answer in the blank space given.

(1) _____ 1. The symbol used to indicate that a substance is a solid is

A. (aq)
B. (g)
C. (l)
D. (s)

(1) _____ 2. The reaction for the combustion of methane is

A. exothermic and absorbs energy
B. exothermic and releases energy
C. endothermic and absorbs energy
D. endothermic and releases energy

(1) _____ 3. The equation for photosynthesis is as follows:

$$\text{energy} + 6\ CO_2(g) + 6\ H_2O(l) \rightarrow C_6H_{12}O_6(aq) + 6\ O_2(g)$$

This reaction is

A. exothermic and absorbs energy
B. exothermic and releases energy
C. endothermic and absorbs energy
D. endothermic and releases energy

(1) _____ 4. The total number of atoms before a reaction is equal to the total number of atoms after a reaction. This illustrates

A. that atoms are all the same size
B. the law of chemical reaction
C. the law of conservation of mass
D. that no new substance is produced in a chemical reaction

Return to page 124 of the Student Module Booklet and begin Section 3: Lesson 2.

For questions 5 and 6, read each question carefully. Decide which of the choices BEST completes the statement. Place your answer in the blank space given.

(1) _____ 5. An equation of chemical symbols and formulas that record the process of a chemical reaction is called a

A. chemical equation
B. formula equation
C. skeleton equation
D. all of the above

(1) _____ 6. Calcium carbonate reacts with sulfur dioxide gas and oxygen gas to produce solid calcium sulfate and carbon dioxide gas. The correct skeleton equation for this reaction is

A. $CaCO(s) + SO(g) + O(g) \rightarrow CaSO(s) + CO(g)$
B. $CaCO_2(s) + SO_2(g) + O_3(g) \rightarrow CaSO_2(s) + CO_2(g)$
C. $CaCO_3(s) + SO_2(g) + O_2(g) \rightarrow CaSO_4(s) + CO_2(g)$
D. $Ca(CO_3)_2(s) + SO_2(g) + O_2(g) \rightarrow Ca_2SO_4(s) + CO_2(g)$

(2) 7. Balance the following formula equation.

$$Al(s) + CuSO_4(aq) \rightarrow Al_2(SO_4)_3(aq) + Cu(s)$$

(7) 8. Balance the following equation, and complete the table. If no coefficient is required in the equation, write "1" in the blank space.

$$____ Mg_3N_2(s) + ____ H_2O(l) \rightarrow ____ Mg(OH)_2(aq) + ____ NH_3(g)$$

Atom	Number of Reactant Atoms Before Balancing	Number of Product Atoms Before Balancing	Number of Reactant Atoms After Balancing	Number of Product Atoms After Balancing
Mg		1	3	
N	2		2	
H	2			
O		2		

(2) 9. Methane gas reacts with steam (water) to produce carbon monoxide gas and hydrogen gas. Write the balanced formula equation for this reaction.

_____

(2) 10. Write the word equation of the following skeleton equation.

$$CuCl_2(aq) + NaOH(aq) \rightarrow Cu(OH)_2(s) + NaCl(aq)$$

Indicate the state of each substance in your word equation.

_____

_____

Return to page 135 of the Student Module Booklet and begin Section 3: Lesson 3.

For questions 11 to 16, read each question carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

(1) _____ 11. A chemical reaction in which a compound and an element react to form a new compound is a

A. formation reaction
B. decomposition reaction
C. single replacement reaction
D. double replacement reaction

(1) _____ 12. A chemical reaction in which a compound is broken down into its elements is a

A. formation reaction
B. decomposition reaction
C. single replacement reaction
D. double replacement reaction

(1) _____ 13. $C_xH_y + O_2(g) \rightarrow CO_2(g) + H_2O(g)$ is the general form of a

A. formation reaction
B. synthesis reaction
C. decomposition reaction
D. hydrocarbon combustion reaction

(1) _____ 14. Which is the correct skeleton equation for water + sodium → sodium hydroxide + hydrogen?

A. $NaOH(aq) \rightarrow H_2O(l) + H_2(g)$
B. $H_2O(l) + Na(s) \rightarrow NaOH(aq) + H_2(g)$
C. $H_2O(l) + Na(s) \rightarrow Na_2OH(aq) + H_2(g)$
D. $HO(g) + Na(s) \rightarrow NaOH(aq) + H(g)$

(1) _____ 15. Which is the correct balanced equation for copper(II) sulfate + aluminium → aluminium sulfate + solid copper?

A. $CuSO_4(aq) + Al(s) \rightarrow Al_2(SO_4)_3(aq) + Cu(s)$
B. $3\ CuSO_4(aq) + 2\ Al(s) \rightarrow Al_2(SO_4)_3(aq) + Cu(s)$
C. $3\ CuSO_4(aq) + 2\ Al(s) \rightarrow Al_2(SO_4)_3(aq) + 3\ Cu(s)$
D. $3\ CuSO_4(aq) + Al(s) \rightarrow Al_2(SO_4)_3(aq) + 3\ Cu(s)$

(1) _____ 16. $NI_3(s) \rightarrow N_2(g) + I_2(s)$ is an example of a

A. formation reaction
B. decomposition reaction
C. single replacement reaction
D. hydrocarbon combustion reaction

17. Classify the following reactions.

(1) a. $C_3H_8 + O_2(g) \rightarrow CO_2(g) + H_2O(g)$

_____

(1) b. $Cs(s) + S_8(s) \rightarrow Cs_2S(s)$

_____

(1) c. nickel(III) nitrate + calcium → calcium nitrate + nickel

_____

(1) 18. Liquid bromine is added to a solution of calcium iodide, and the mixture is stirred. A reaction occurs that produces two products. What are the two products?

_____

Return to page 156 of the Student Module Booklet and begin Section 3: Lesson 4.

For questions 19 to 24, read each question carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

(1) _____ 19. Which element was chosen as the standard for defining a mole?

A. iron
B. carbon
C. hydrogen
D. oxygen

(1) _____ 20. How many grams is in one mole of CO_2?

A. 12.01 g
B. 16.00 g
C. 28.01 g
D. 44.01 g

(1) _____ 21. How many moles are present in 500.0 g of H_2O?

A. 9010
B. 247.5
C. 31.25
D. 27.75

(1) _____ 22. The mass of 4.50 mol of calcium carbonate is

A. 450 g
B. 306 g
C. 100 g
D. 4.50 g

(1) _____ 23. Atomic molar mass is defined as

A. the mass of one atom
B. Avogadro's number of atoms
C. the mass of one mole of an element
D. the average mass of one mole of an element

(1) _____ 24. When calculating the number of moles of $Na_2SO_4(s)$, the factor used is

A. $\frac{1 \text{ mol}}{119.06 \text{ g}}$

B. $\frac{1 \text{ mol}}{142.05 \text{ g}}$

C. $\frac{119.06 \text{ g}}{1 \text{ mol}}$

D. $\frac{142.05 \text{ g}}{1 \text{ mol}}$

(1) 25. _____ is to one mole as twelve is to one dozen.

(3) 26. Calculate the mass of 2.50 mol of $CH_3OH(l)$. **Show your work**. Use the appropriate number of significant digits in your final answer.

(3) 27. How many moles are present in 356.4 g of $NiBr_3(aq)$? **Show your work**. Use the appropriate number of significant digits in your final answer.

Submit your completed Assignment Booklet 1C to your teacher for assessment.

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